96-112-20

SCOTT RIVER STREAMBANK PROTECTION
TOZIER RANCH

Funded By

THE UNITED STATES FISH AND WILDLIFE SERVICE

Project # 14-48-0001-96613

Sponsor:

Siskiyou Resource Conservation District
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BACKGROUND: The Scott River drainage, located in Scott Valley, is a tributary to the Klamath River. Elevation of the headwaters reach 8,000 feet while Scott Valley, the private sector, sits at 2,900 elevation. The Scott River continues to be a major fish producing tributary to the Klamath River supporting Chinook, Coho, and Steelhead. Yet, like most north coast streams, the Scott River has experienced a decline in the return of adult anadromous fish. The Siskiyou Resource Conservation District (RCD) and Scott River Coordinated Resource Management Plan (CRMP) have chosen to be proactive in rehabilitating the Scott River watershed and appreciates the assistance provided by the US fish and Wildlife Service

Scott River runs through both public and private property. The head waters and lower canyon stretch are mostly public property within the USFS jurisdiction, while the foothills and valley floor are mostly private. Private property is dominated by agriculture on the valley floor while timber interests and residential property are located outside of the valley floor. The project site funded by the CDFG is located in the lower portion of the valley floor where the gradient of Scott River is roughly .4%. The restoration project took place on property owned by Ben Tozier. The Tozier Ranch produces hay, grain and cattle.

Alteration of the Scott River watershed began in the 1850's when gold was discovered in the head waters and over half of the tributaries. Heavy placer and hydraulic mining continued until the 1940's. Nearly a century of placer mining stream banks dramatically increased sediment loads which is still evident today. In 1938 the Army Corps of Engineers channeled the river by adding levees through the center of Scott Valley. The Army Corps also straightened and deepened the channel of the Scott River and some major tributaries to increase drainage. Other federal government programs also straightened stream channels and developed drainage ditches in order to increase drainage during the winter months. The aim of the projects were to protect and increase agricultural and residential areas.

Early documentation of the Scott River describe the active channel as only 80-120 feet wide, with slow moving water due to beaver dams. The active channel is now over 200 feet wide in many locations and the increased drainage programs has increased flow velocities, creating a fluctuating water table.

The combination of a fluctuating water table, increased water velocities and bank erosion has created a system which cannot naturally propagate a riparian zone in some places. The best riparian areas throughout the section are where successful bank stabilization projects have occurred. Stabilized banks prevent high water velocities from eroding the root base of young trees. Livestock exclusion and initial irrigation of trees after planting mitigate the limiting factors which have reduced the riparian zone along the Scott River. Observation has found that propagation of a riparian area does continue after it has been

established within this river section. The expected reason for continued propagation after establishment is due to collection of fine silt (high water holding capacity), increased shade and protection from browsing and weather extremes.

SITE DESCRIPTION: The project site is characterized by a shallow channel depth and lack of shade which contributes to increased stream temperature during the low flow summer months. Channel bottom diversity is low due to high sediment loads and a lack of large woody debris. Holding and rearing pools for salmon and steelhead are few and lack sufficient cover. The goal of the project was to stabilize eroding banks so riparian zones could become established, provide shade, channel complexity and trap sediment in order to confine the channel.

The Tozier Project is only one of three projects which which took place on four contiguous landowners owners stream corridor. The combination of three funding sources throughout the 2.3 mile section is called the Lower Scott Program. Funding sources include the California Department of Fish and Game, US Fish and Wildlife Service, Wildlife Conservation Board and the landowners

Lower Scott Program: A recent objective of the Siskiyou Resource Conservation District has been to combine several projects within a section of a stream and develop a holistic goal of recovery and enhancement throughout a significant section. The USFWS funding is one of three funding sources which combine to create a restoration program. A program identifies then applies methods to correct several limiting factors rather then one factor.

The combined projects of the Lower Scott Program were funded by the WCB, CDFG, US Fish and Wildlife Service (USFWS) and the property owners. Originally, the Natural Resource Conservation Service was also involved but withdrew its funding due to concern by the property owner, Ralph Smith. The CDFG and USFWS funding both focused on bank stabilization, development of in-stream structures, riparian planting and fencing, while the WCB funding focused on planting and fencing. The RCD and the Scott River Coordinated Resource Management Plan (CRMP) have both identified a higher priority for combined projects which create significant contribution towards riparian corridor recovery.

The net gain created by the Lower Scott Program includes stabilization of 1,750 feet of rapidly eroding banks, installation of 26 in stream structures which provide cover and complexity (which is lacking through this reach) construction of 8,450 feet of riparian fencing and over 8 acres of riparian planting. The riparian fencing installed by the three projects now provides an excluded riparian corridor which covers 13 miles of the Scott River. This will be an interesting area to monitor over the next ten years in order to determine the influence livestock has had within the Scott River corridor.

Tozier Project scope funded by USFWS: The scope of the Scott River Streambank Protection Project funded by the USFWS installed bank protection to arrest erosion on 815 feet of eroding bank, constructed 16 large boulder groupings to increase in-stream complexity, built 7,080 feet of riparian fence and planted over six and one half acres of riparian plantings along Tozier's property.

Construction Methods:

In-stream: The in-stream structures are jetty like structures (Deflectors) which extend perpendicularly out into the stream. The structures are composed of large boulders (3'-4' diameter) and/or trees with root wads. A typical structure extend 15 to 18 feet into the Scott River. Deflectors were placed 45 feet apart with armoring placed between the deflectors. The deflector reduces the velocities along the stream bank by forcing the thalweg (portion of the stream cross-section which has highest velocities) towards the center of the stream. Deflectors also turn laminar flow into turbulent flow at the tip of the structure. The turbulent flow creates a scour pool which provides cover for fish. The RCD installed 16 deflectors which held and protected the bank through the 1997 New Year Flood, a 40+ year event.

The Tozier project was initially difficult because the bank that was funded to be stabilized was occupied by Bank Swallows, a State threatened specie. Through much consultation with the CDFG, the compromise was made to dig a trench behind (15' behind the existing bank) the swallow nesting habitat and armor the trench. During the 1997 flood, the location where the Bank swallows had nested filled in in lost its vertical, cliff-like bank. It then became unusable nesting habitat for the Bank Swallows.

Fencing: The landowner constructed 7,080 feet of fence along the Scott River. Mr. Tozier constructed a 5 wire fence with a wooden post located on one out of every five posts. One average the fence is fifty feet from the active channel. This gave the RCD a large enough corridor to plant trees a continuos corridor of trees in order to establish a riparian zone. The fencing installed is a five wire fence with posts set on a 12 foot spacing. A wooden post is set every five posts with 6' metal posts in between.

-Planting: Two planting methods were installed which the RCD is very confident about. One method used a post hole auger fixed to a back-hoe. The auger could reach depths of up to eight feet below the soil surface. Holes were augured deep into the soil over a 2.3 acre region (.4 acres funded by CDFG). Live willow and cottonwood posts (large diameter material exceeding 10") were collected, placed in the holes, then filled with dirt. Approximately 18" of the stock extends out of the ground while 7-8 feet remains buried where it can reach the water table during low flow periods in the late summer.

The second method used is rather similar. 10'-15' long trenches were dug with a back hoe. The trenches were then filled with long willow branches which extended approximately 1' above the ground. The trenches were 6-8 feet deep. The size of the material used in the trenches was much smaller (less then 3" in diameter) then the stock

used in the auger holes. Drip line was extended throughout the trenched region to provide additional water during the summer.

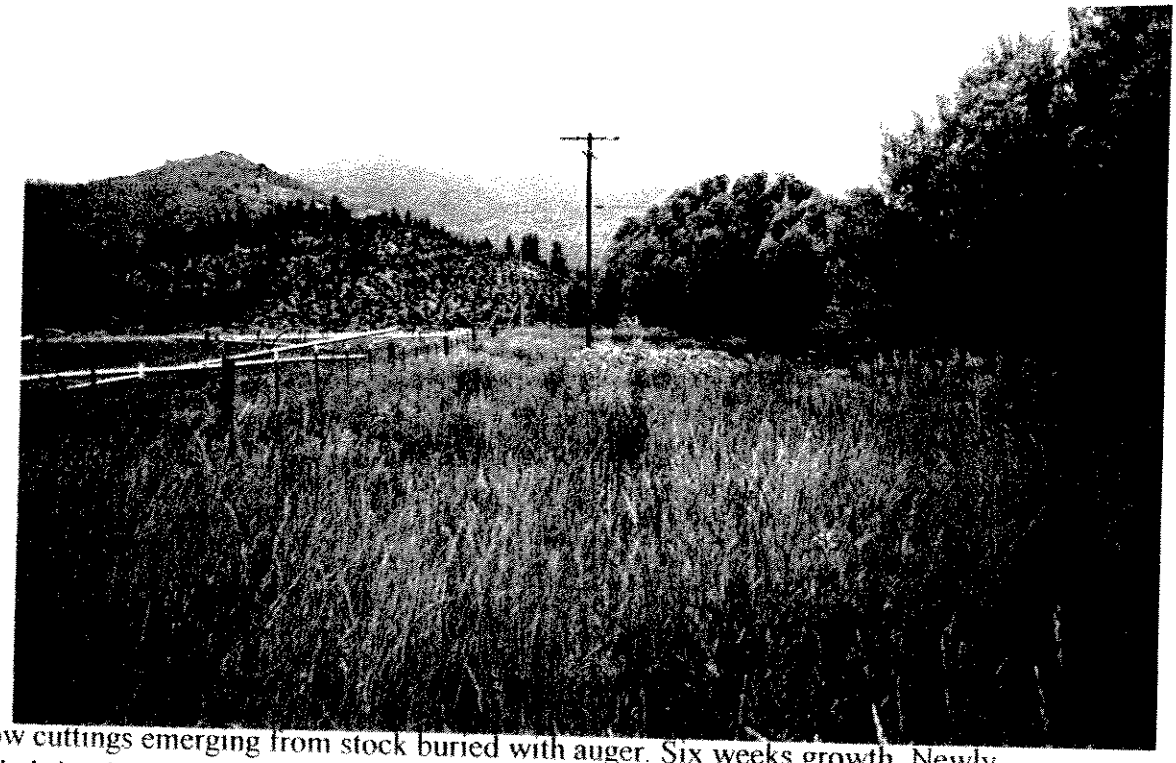
As of July 14th, 1997 nearly all the cuttings were thriving. six trees of over 350 trees had died in the last several weeks due to annual competition and a poor water year. The average growth is roughly 4' since spring with some cuttings exceeding 6'. The RCD is very excited about the possibilities of these planting techniques. Maintenance is minimal and the cost is inexpensive compared to installing and maintaining a drip irrigation system.

We are confident the Tozier Project in conjunction with the Lower Scott Program is going to provide a beneficial riparian corridor along 2.3 miles of the lower Scott River. The Siskiyou RCD appreciates the USFWS's support. Carl Harral, Contract Administrator for the CDFG, provided design assistance and project approval.

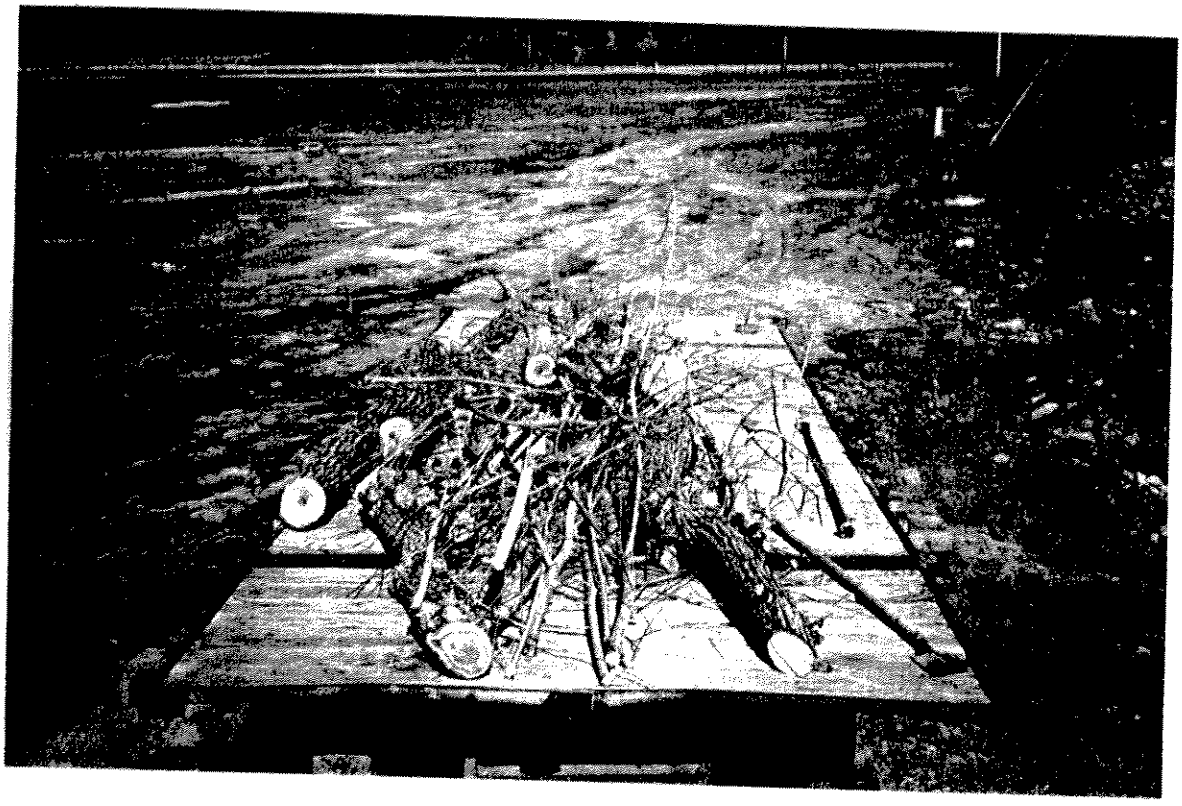
Completed Budget for Contract # 14-48-0001-96613

ITEM:	BUDGETED:	EXPENDED:
SALARIES	$ 3,679.85	$ 3,679.85
TRAVEL	$ 161.00	$ 200.00
MATERIALS	$36,712.39	$36,712.39
PLANTING	$ 4,901.41	$10,901.41
STOCK WATER (OPTIONAL- OR INCREASED PLANTING)	$ 6,000.00	$ 0.00
ADMINISTRATIVE		
10%	$ 4,545.00	$ 4,545.00
Total	**$50,000.00**	**$50,000.00**

Willow emerging from 3 cuttings placed in a trench. Six weeks of growth from ground level



Willow cuttings emerging from stock buried with auger. Six weeks growth. Newly installed riparian fence to the left

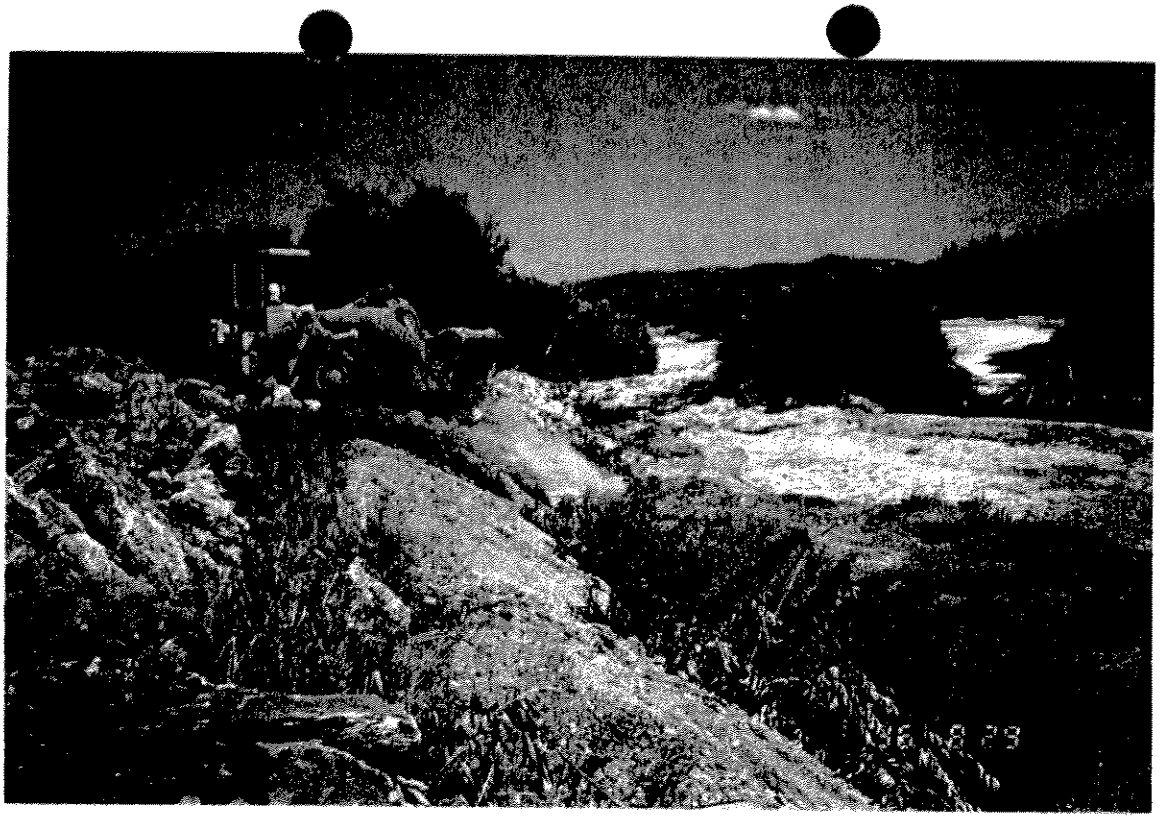


Cuttings which were buried 5 to 7 feet into the ground

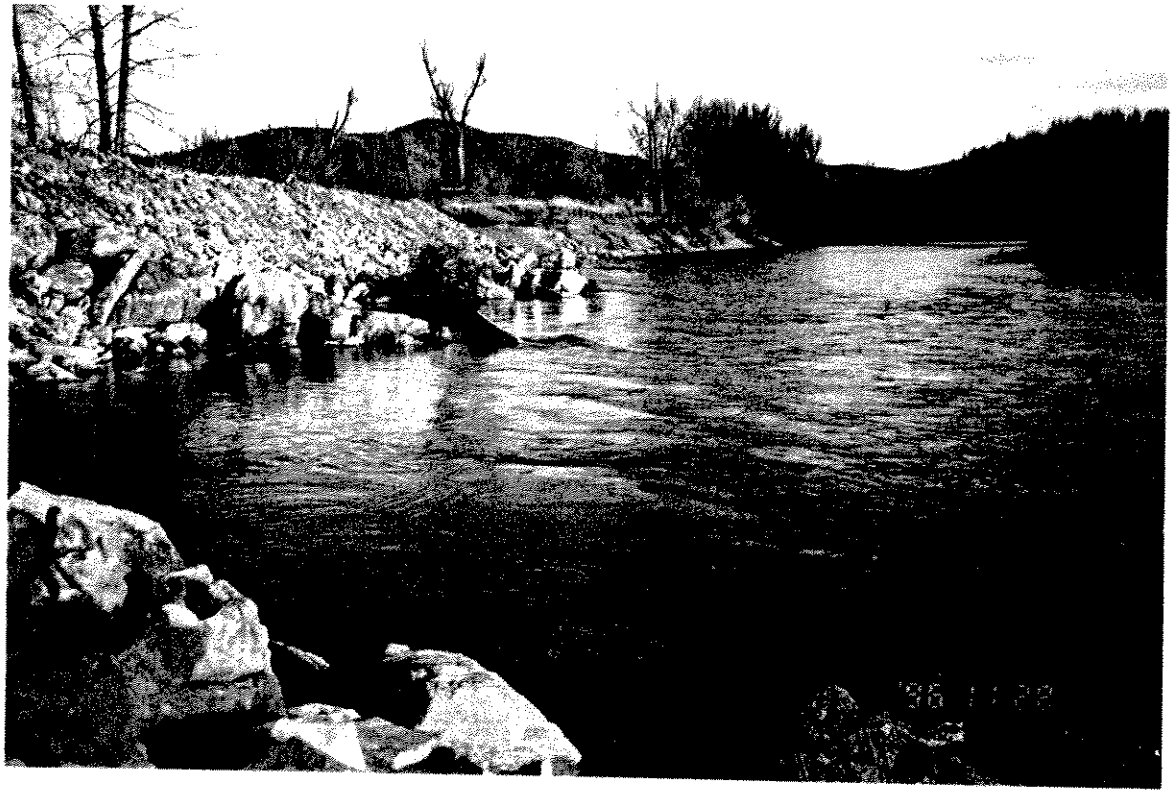
Completed willow cuttings in March of 1997. 100% survival rate as of July 1st 1997

Decadent stands of willow used for planting (cutting) stock

Regrowth of decadent willows after using material for stock

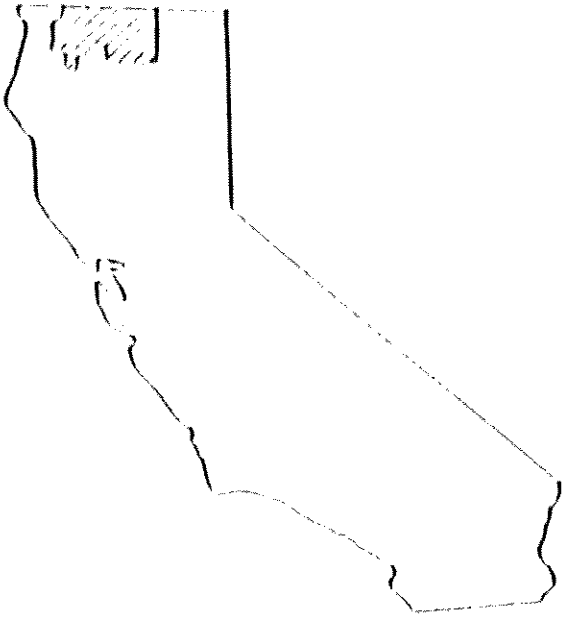


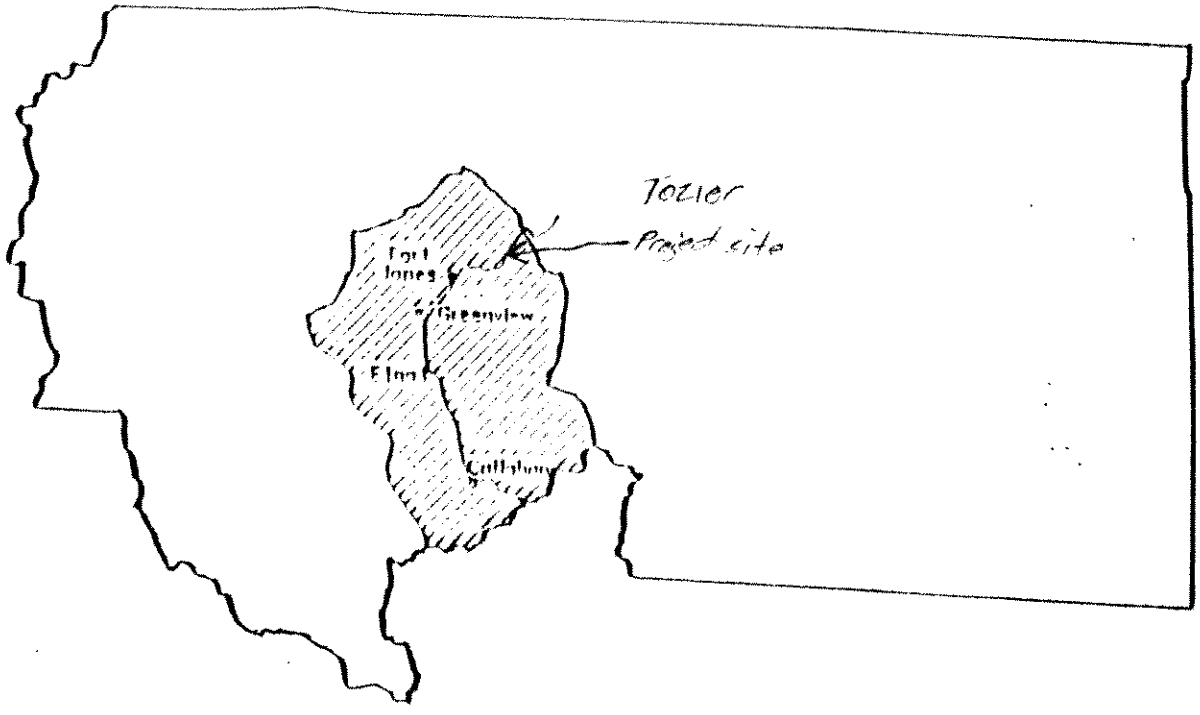
Willows placed in toe trench of bank armoring work can increase riparian recovery time



Completed bank stabilizatiion and in-stream structures (deflectors).

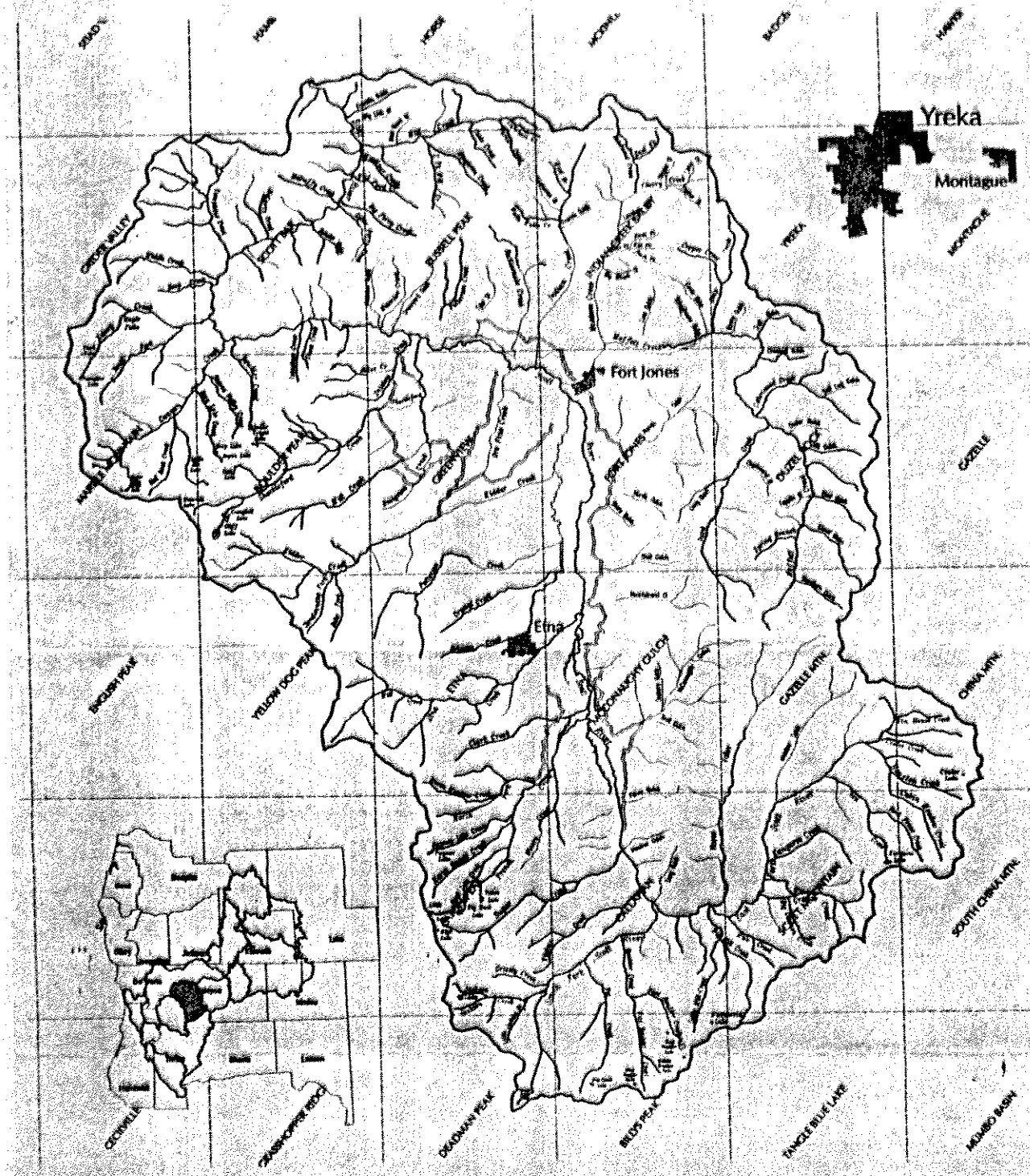
REGIONAL LOCATION





MAP A

SCOTT RIVER HYDROLOGIC SUBBASIN



Please indicate the location of the proposed project. Indicate the project location by placing a colored point on the base map provided. For projects that are linear in nature, please highlight the stream reach of the proposed project.

5 2.5 0 5 10 15
kilometers

N Perennial Stream
Intermittent Stream
Ditch or Canal
1:24,000 USGS Quad

N

USFWS Project Number: 14-48-0001-96613

CDFG Project Number:

Project Proponent: Siskiyou RCD

Project Title: Scott River Streambank Protection - Tozier Ranch

Fiscal Year: 1996 + 1997

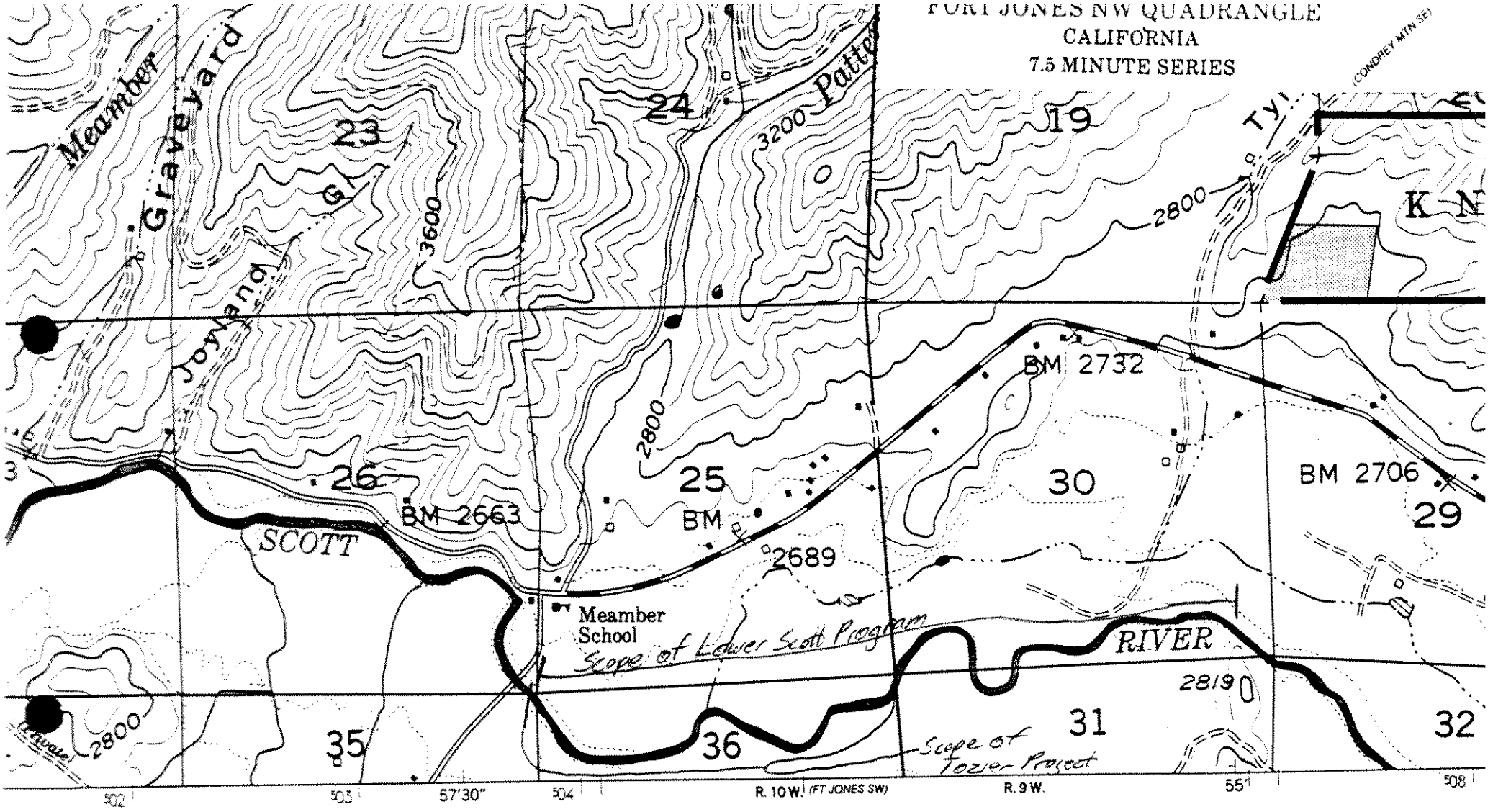
Stream Name: Scott River

Tributary To: Klamath

USGS Quad Name (1:24,000): Russell Peak

Township/Range: 7N1 R10W

Section Number: 36+35



SCALE 1:24 000

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1984 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

LEGEND

- National Forest Boundary
- Alienated Land within the National Forest Boundary

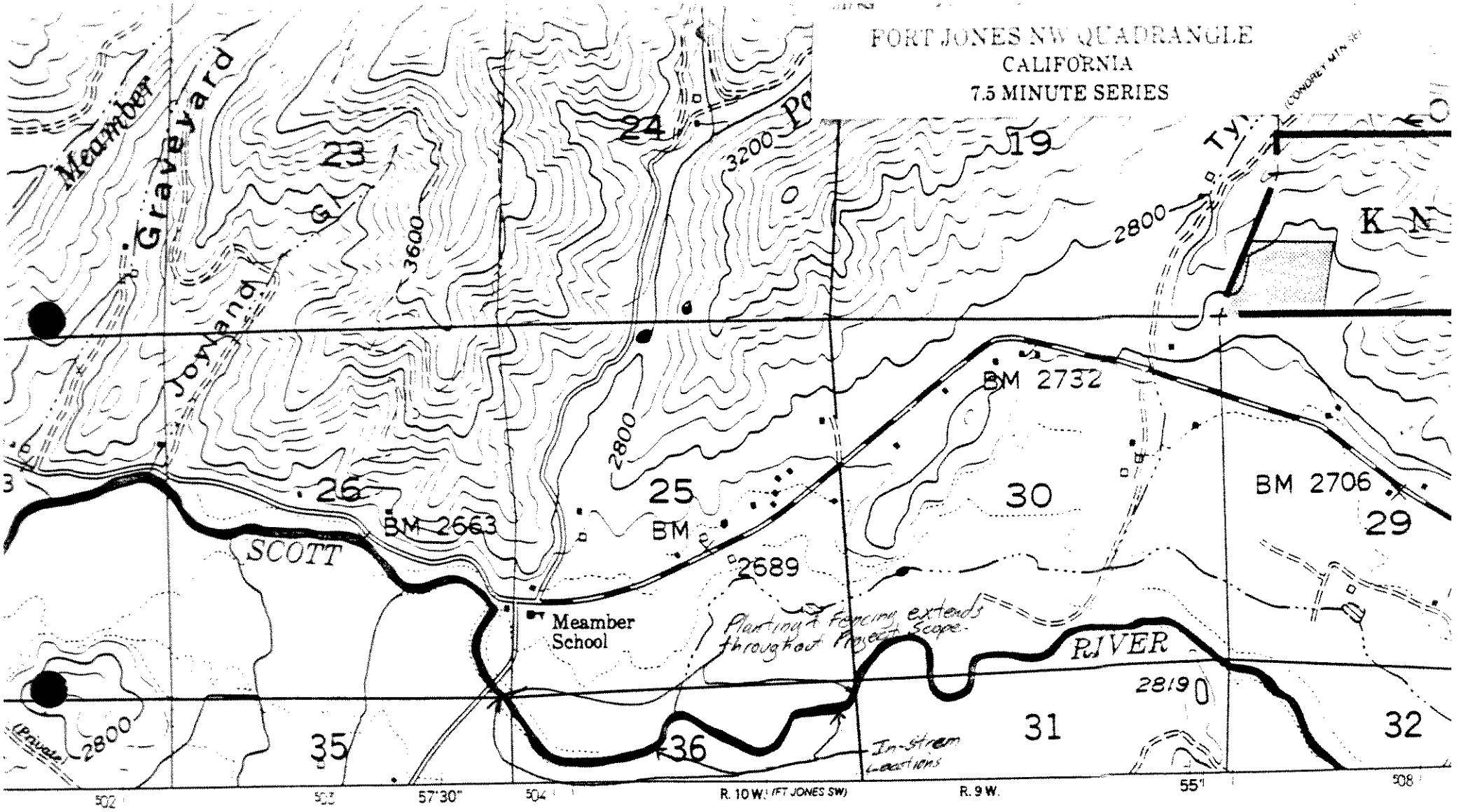
TOWNSHIP AND SECTION LINE CLASSIFICATION

- Surveyed, Location Reliable
- Surveyed, Location Approximate

- Primary Highway
- Secondary Highway
- Improved Light Duty
- Unimproved Dirt
- Trail
- Locked Gate

- U.S. Highway
- State Highway
- County Road
- Forest Highway
- Forest Road
- Forest Trail

KLAMATH



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